AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

Claims 1-12 (Cancelled).

13. (New) A method of manufacturing a silicon carbide (SiC) vertical MOSFET, the method comprising:

forming an SiC mask on a surface of an epitaxial layer of SiC, the SiC mask having a tapered shape in cross-section, with side surfaces forming an angle with respect to a normal to the surface of the epitaxial layer of SiC in a range from 30° to 60°;

implanting first ions into the epitaxial layer of SiC through the surface, using the SiC mask as an ion implantation mask, to produce a base region having a first conductivity type in the epitaxial layer of SiC; and

implanting second ions into the epitaxial layer of SiC through the surface, using the SiC mask as an ion implantation mask, to produce a source region having a second conductivity type, opposite the first conductivity type, within the base region, so that at least the base region has an interface forming an angle with respect to the normal to the surface in a range from 30° to 60°.

14. (New) The method according to claim 13 including implanting the first ions along a direction oblique to the normal to the surface and implanting the second ions along the normal to the surface.

15. (New) The method according to claim 13 including implanting the first and second ions at respective angles oblique to the normal to the surface so that both the base region and the source region have interfaces forming an angle with respect to the normal to the surface in a range from 30° to 60°.

16. (New) The method according to claim 13 including simultaneously implanting the first ions and the second ions.

17. (New) A method of manufacturing a silicon carbide (SiC) vertical MOSFET, the method comprising:

forming an SiO_2 mask on a surface of an epitaxial layer of SiC, the SiO_2 mask having a tapered shape in cross-section, with side surfaces forming an angle with respect to a normal to the surface of the epitaxial layer of SiC in a range from 25° to 45°;

implanting first ions into the epitaxial layer of SiC through the surface, using the SiO_2 mask as an ion implantation mask, to produce a base region having a first conductivity type in the epitaxial layer of SiC; and

implanting second ions into the epitaxial layer of SiC through the surface, using the SiO_2 mask as an ion implantation mask, to produce a source region having a second conductivity type, opposite the first conductivity type, within the base region, so that at least the base region has an interface forming an angle with respect to the normal to the surface in a range from 30° to 60°.

18. (New) The method according to claim 17 including implanting the first ions along a direction oblique to the normal to the surface and implanting the second ions along the normal to the surface.

19. (New) The method according to claim 17 including implanting the first and second ions at respective angles oblique to the normal to the surface so that both the base region and the source region have interfaces forming an angle with respect to the normal to the surface in a range from 30° to 60°.

20. (New) The method according to claim 17 including simultaneously implanting the first ions and the second ions.

21. (New) A method of manufacturing a silicon carbide (SiC) vertical MOSFET, the method comprising:

forming an SiC mask on a surface of an epitaxial layer of SiC, the SiC mask having side surfaces substantially parallel to a normal to the surface of the epitaxial layer of SiC;

implanting first ions into the epitaxial layer of SiC through the surface in a direction forming an angle not larger than 70° with the surface, using the SiC mask as an ion implantation mask, to produce a base region having a first conductivity type in the epitaxial layer of SiC; and

implanting second ions into the epitaxial layer of SiC through the surface in a direction substantially parallel to the normal, using the SiC mask as an ion implantation mask to produce a source region having a second conductivity type, opposite the first conductivity type, within the base region, so that channel length of the base region, measured along the surface, is at least 0.3 microns.

22. (New) The method according to claim 21 including simultaneously implanting the first ions and the second ions.

23. (New) A method of manufacturing a silicon carbide (SiC) vertical MOSFET, the method comprising:

forming an SiO_2 mask on a surface of an epitaxial layer of SiC, the SiO_2 mask having side surfaces forming substantially parallel to a normal to the surface of the epitaxial layer of SiC;

implanting first ions into the epitaxial layer of SiC through the surface in a direction forming an angle not larger than 75° with the surface, using the SiO_2 mask as an ion implantation mask, to produce a base region having a first conductivity type in the epitaxial layer of SiC; and

implanting second ions into the epitaxial layer of SiC through the surface in a direction substantially parallel to the normal, using the SiO_2 mask as an ion implantation mask to produce a source region having a second conductivity type, opposite the first conductivity type, within the base region, so that the base region has a thickness, relative to the source region, of at least 0.3 microns.

24. (New) The method according to claim 23 including simultaneously implanting the first ions and the second ions.